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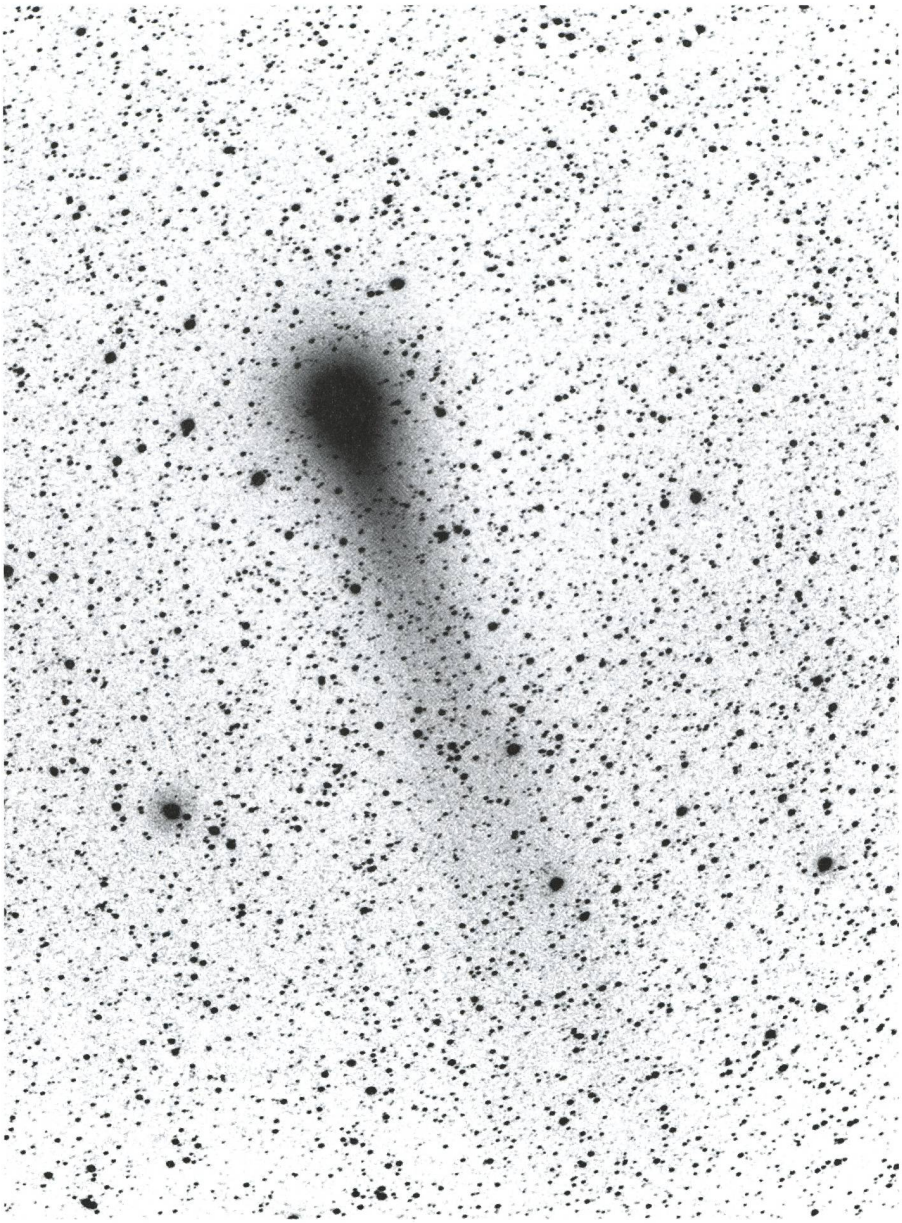
La comète C/2001 A2 - Linear

La comète de l'été était bien visible toute la nuit. Aux jumelles, elle apparaissait toute ronde sans queue apparente. Photo prise avec un téléobjectif de 400 mm de focale.

ARMIN BEHREND
Les Parcs, CH-2127 Les Bayards/NE



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End of a satellite

MICHAEL MARTIN-SMITH

June 4, 2000 saw the safe controlled re-entry of one of NASA's less known but most successful space observatories. Launched in 1991 from the Space Shuttle, the second of NASA's Great Observatories had a design life of 5 years. At a weight of 17 tons it was the largest unmanned science satellite ever launched by the USA. Its task was to examine the heavens in the most highly energetic wavelength of all – Gamma radiation. In the event the craft operated without a hitch for 9 years and a decision was taken to de-orbit it in a controlled manner on the failure of one of its three steering gyroscopes. This was primarily a safety decision, as NASA wanted to avoid a 17 ton satellite landing in a populated region. The safe re-entry into an uninhabited area of ocean showed this decision to be correct, but brought to an end one of the least known but possibly most significant eras of space science, with implications for the very future of advanced life throughout the Cosmos.

Electromagnetic radiation ranges in wavelength from long radio waves via infra-red visible light, ultraviolet , Xrays, and finally gamma rays – the shortest, most energetic wavelength of all. All these waves travel at the speed of light and their energy is inversely proportional to their wavelength. Very roughly electromagnetic waves correspond to increasing temperature and energy level of cosmic activities as the wavelength is shortened, with gamma rays signifying the most energetic processes of all.

How did the need for such an obscure scientific investigation come to pass?

In the 1960's gamma rays were more widely known through their lethal association with human nuclear explosions here on Earth, and so the US Defence Department had in place satellites to monitor nuclear tests and explosions by recording the gamma ray signatures of such events.

It soon emerged that there were gamma ray explosions or bursts lasting from a few seconds to 20 minutes or so which had nothing to do with human military ambitions, since they came from well beyond our stellar neighbourhood. Little was known at that time except that they were either due to totally unimaginable violent processes occur-

ring at a vast distance beyond our Galaxy, or that they might be due to less violent but unknown «local» processes.

It was largely to settle such questions that the Gamma Ray Observatory, named Compton after one of the early pioneers of radioactivity, was launched.

During its first 8 years of operation Compton detected and took signatures of 2000 of these Gamma ray explosions, now termed Gamma Ray Bursters (GRBs) , and have demonstrated statistically that the vast majority occur at vast distances well beyond our own Milky Way Galaxy – even several billion light years from Earth, and that for their brief moments of glory they produce as much energy in gamma rays as the total energy output of an entire galaxy of 100 billion stars like the Sun!

Thoughts then turned to the possible mechanisms for such unthinkable energy releases. The current best contender is a collision between the members of a co-orbiting pair of neutron stars. These are the ultradense remnants of stars which weigh more than 1.4 times the mass of our Sun at their lives' end, and although so massive are only the size of a large city. Thus the mass of considerably more than our Sun is compressed into a ball 20 kilometres or so in diameter and the atomic matter exists as nuclear particles called neutrons. If two such objects in a pair collide, the energy release is sufficient to account for the Gamma Ray Burster phenomenon. Another mechanism is an ultraviolent form of Supernova – supernovae are explosions which temporarily outshine their entire host galaxy caused by the collapse of heavy stars at the end of their life cycle, whose ultimate product is either a neutron star or a black hole.

They are thus the violent deathroes of massive stars; in an extreme case – called a Hypernova – the collapsing star sends such a powerful rebounding shockwave through its surrounding shells of gas that the fireball is «seen» predominantly in gamma radiation rather than the more normal flash of visible light! The usual fiery ending is seen by us as a brilliant supernova – the best known in our time being the supernovae of 1987 in the Greater Magellanic Cloud, while the Crab Nebula in the constellation of Taurus is the result of such a supernova – known to the Chinese as a guest star – seen in 1054 AD.

Although GRBs seen to date have all been at vast distances, there are neutron stars and supernovae in our own Milky Way Galaxy and the objects observed by Compton have not been discriminating in their choice of host galaxy type . Thus there is no a priori reason to assume that our galaxy is immune, and on the statistical basis observed so far we can expect one to occur somewhere in our Galaxy every 100 000 years or so; more to the point, the best estimate is that one will occur within 3000 light years of Earth every 10 to 100 million years on a statistically unpredictable basis. So great is the radiation level emitted by a GRB that scientists believe that any planet within 3,000 light years of such an event will be sterilized of all but its most hardy and simple life forms.

Humanity and its civilization, of course, would have no chance except on one condition. Humanity will survive as a mindful and civilized species only if it is, at the time of such an event, already occupying an ecological niche significantly greater than 3000 light years in extent. This means that our longterm future depends on our building an interstellar civilization – a task which will take many thousands of years. The best guess is that we have a few million years' grace, but we do not and cannot know this. In a race against an unknown

deadline where the choice is between life and death the wisest counsel is not to waste too much time arguing the toss, but to put our hands to the astronautical plough.

Diaspora for Humans as a species, just as for Jewry as a culture, is a dynamic, evolutionary, strategy for growth and development in a capricious and changeable Universe. Thus it seems that the little known Compton Observatory has a vital message for Humankind «The Future for Man, in the end, is all the Universe – or Nothing!»

Meanwhile, the clock is ticking...

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Bibliographie

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and «Man Medicine and Space» available from www.iuniverse.com or <http://www.amazon.com>www.amazon.com

Les Potins d'Uranie

Le Grand Feu

AL NATH

Ces sapins avaient toujours été là, argentés ou plutôt cendrés, disposés en ovale en bordure du village, avec un plus petit à la traîne. Et ils semblaient vraiment immuables dans le temps.

Il se disait, dans ce hameau des hauts-plateaux, que c'était là que les sœurs PETIT-THOMAS avaient fait leur dernière ronde endiablée, avant de devenir bien visibles là-haut dans le ciel surtout par les longues nuits d'hiver. L'histoire appartenait à la mémoire sans date et faisait partie de la moralisation des jeunes filles.

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C'étaient de sacrées natures, ces sœurs PETIT-THOMAS. Les six aînées en tout cas, la dernière étant encore une gamine à l'époque des faits, mais tout le monde s'attendait à ce qu'elle devienne pareille aux autres.

Vivant avec leur mère déjà âgée et inconsolable de la disparition de leur père dans une tourbière, sans autre homme à la maison, les sœurs faisaient tourner tant bien que mal leur fermette en lisière de forêt. Au-delà, c'étaient les hauts-plateaux et leurs pièges marécageux.

Une nature hostile et les tâches ingrates en avaient fait de maîtresses femmes, superbement bâties, généreuses au labeur comme en amours, mais n'ayant encore réussi à convaincre aucun galant de se fixer dans leur univers familial, un peu particulier en effet. Adopter l'une, c'était les accepter